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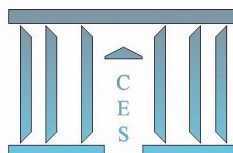
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The euro as an international currency

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Abstract. The euro, in spite of having many of the required attributes put forward by the theoretical literature and past experience, has failed to fulfill all the criteria that would enable it to rival the dollar as an international currency. This does not mean that the euro cannot achieve a status similar to that of the dollar; however, the window of opportunity may not last much more than a decade before the renminbi overtakes the euro. European monetary unification has never explicitly sought for its currency to gain an international status. This makes sense insofar as the key elements required for the euro to expand internationally are also those to be pursued internally: GDP growth; a fiscal backing to the single currency; a deep, liquid and resilient capital market; and a unified external representation of the euro area.

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1. Introduction

Launching an international currency has never been the primary objective of European monetary unification.² Europeans could still legitimately expect their single currency to reach an international status given its ranking as the currency of the first international trade power, with a population larger than that of the US. Over the first decade of its existence, the euro developed both as a regional and as a diversification currency. While the euro area crisis in 2010 did not put an end to this (limited) movement of internationalization, it has become clear that reaching full internationalization will require further steps in European integration. In this chapter, we first define the concept of an international currency (Section 2). We then rely on the theory (Section 3) and history (Section 4) of international currencies to outline the conditions needed for the euro to become a fully-fledged international currency (Section 5), before analyzing the consequences of such an evolution for the euro area and for international monetary stability (Section 6). Section 7 offers tentative conclusions.

2. What is an international currency?

2.1 The six functions of an international currency

An international currency is a currency that fulfills the three functions of money (medium of exchange, unit of account and store of value) in an international context. Cohen (1971) and Krugman (1984) go one step further and differentiate between the private and the official sectors. A fully-fledged international currency should thus fulfill six functions (Table 1). The private sector uses the international currency as a medium of exchange for trade in goods, services and assets. It also uses it as a way to cheaply exchange two currencies (by carrying out two separate transactions against the international vehicle³) and as an invoice currency for goods (e.g. oil)⁴ and assets (e.g. emerging countries' debt). In addition, private funds invest in the international currency as a way to limit their risk exposure and safeguard their liquidity. On the official side, central banks and sovereign wealth funds use the international currency for their foreign-exchange interventions, as a reserve currency and as a nominal anchor.

Table 1. Roles of an international currency

	Private	Official
Medium of exchange	Vehicle	Intervention
Unit of account	Invoice	Peg
Store of value	Banking	Reserve

Source: Krugman (1984).

Although these different functions tend to reinforce each other, a currency may fulfill only some international functions. For example, before 1999, the European Currency Unit (ECU – a basket of European currencies) played only a limited role as a medium of exchange for central banks, and as a store of value for both the private and the public sectors; it played a more important role as an anchor currency, but was neither a vehicle nor an invoicing

² See ECB (1999): “Since the internationalisation of the euro, as such, is not a policy objective, it will be neither fostered nor hindered by the Eurosystem. [...] The Eurosystem therefore adopts a neutral stance, neither hindering nor fostering the international use of its currency.” (p. 31, 45).

³ For instance, it is cheaper to exchange the Korean won for the US dollar, and then the latter for the Mexican peso, rather than to directly exchange the Korean and Mexican currencies on a market that offers limited liquidity.

⁴ Based on a survey of Swedish companies, Friberg and Wilander (2008) show that the same currency tends to be used for invoice and for settlement.

currency. The Special Drawing Rights (SDR) issued by the International Monetary Fund (IMF) are used only by the official sector. As for the yen, sterling and Swiss franc, their international use mainly concerns the store-of-value function, far less the means-of-exchange or unit-of-account ones.

2.2 The limited internationalization of the euro

Since its introduction in 1999, the euro has developed into an international currency, essentially as a store-of-value, for both the official and the private sectors (Table 2). However, the share of the euro in international portfolios remains limited, especially for cross-border bank loans. In fact, while the euro may have emerged as an important diversification currency, it has not yet become a liquidity management currency or a vehicle. Although the euro was involved in 33.4 percent of foreign exchange turnover in April 2013, this figure drops to 9.3 percent of total turnover when excluding euro-dollar trades.

Table 2. International currencies at end-2013
(market shares in %)

Function	USD	YEN	EUR	Other
Medium of exchange				
Foreign exchange turnover, April 2013 ⁽¹⁾	87.0	23.0	33.4	56.6
Unit of account				
Invoicing/settlement of euro area exports of goods to non-euro area, 2013	na	na	67.2	na
Invoicing/settlement of euro area imports of goods from non-euro area, 2013	na	na	51.7	na
Third countries currency pegs, ⁽²⁾ April 2013	53.8	0.0	25.0	21.2
Store of value				
Allocated official reserves, 2013 Q4	61.2	3.9	24.4	10.5
Outstanding international debt securities, narrow measure, ⁽³⁾ 2013 Q4	54.8	3.5	25.3	16.5
Outstanding international debt securities, broad measure, ⁽⁴⁾ 2013 Q4	40.5	2.5	37.8	19.3
Outstanding cross-border bank loans, narrow measure, ⁽⁵⁾ 2013 Q4	69.2	4.0	14.2	12.5
Outstanding cross-border bank loans, broad measure, ⁽⁶⁾ 2013 Q4	56.9	3.2	18.3	21.7

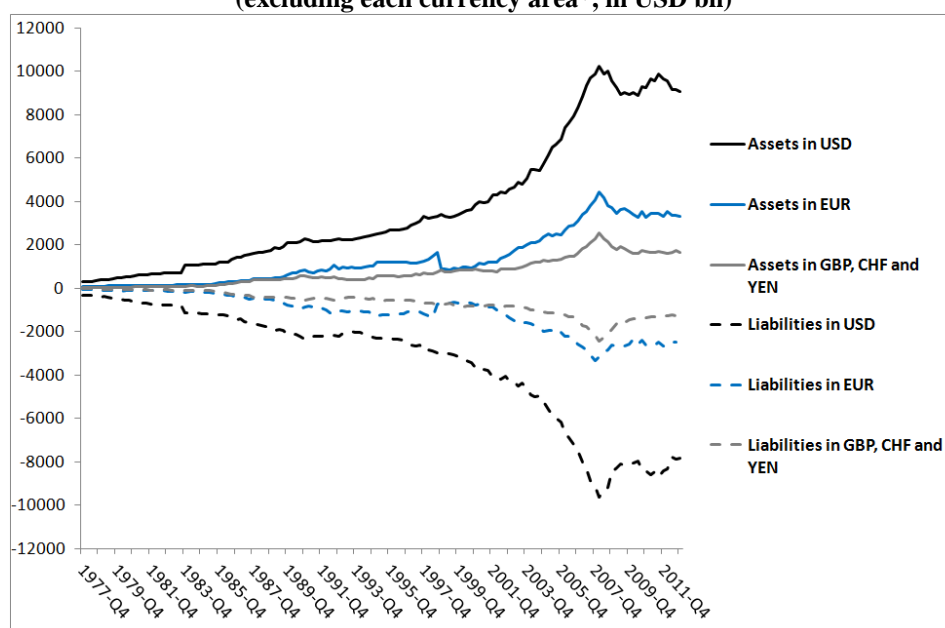
Notes : ⁽¹⁾ out of 200%; ⁽²⁾ Out of 104 pegged or semi-pegged currencies; ⁽³⁾ excluding domestic issuance of international debt; ⁽⁴⁾ including domestic issuance of international debt; ⁽⁵⁾ loans by banks outside the euro area to borrowers outside the euro area; ⁽⁶⁾ all cross-border loans.

Sources: Bank of International Settlements (2013); European Central Bank (2014); International Monetary Fund (2013).

The cross-border balance sheet of European banks did expand considerably during the 2000s, yet most of this expansion was in dollars (Figure 1). This dependence on the dollar proved a major factor of vulnerability during the international financial crisis (Ivashina et al., 2012): private short term financing suddenly dried up, forcing the ECB to request a currency swap line with the Federal Reserve so as to be able to provide both euro and dollar loans to the European banking sector. In order to stabilize the banking sector, these temporary swap arrangements were converted to standing arrangements in 2013 (i.e. arrangements that will remain in place until further notice).

Perhaps the euro's rise as an international financing currency in the first decade of its existence is to be considered its main achievement. Using the so-called "broad" definition, the euro's share in outstanding international debt securities overtook that of the dollar as early as 2005-6. Observers ascribed this development to the significant increase in liquidity, triggered by the creation of the single currency, in euro-denominated debt securities markets compared with liquidity in legacy currency markets (Papaioannou and Portes, 2008). This share has somewhat declined since the outbreak of the euro area's debt crisis.

**Figure 1. Gross assets and liabilities of banks outside the United States
(excluding each currency area*, in USD bn)**



* e.g. assets in USD excluding assets in USD of banks located in the United States.

Source: Bank of International Settlements.

As for the unit-of-account function, the creation of the euro has progressively allowed the invoicing and settling in euro of a large share of trade conducted with non-euro partners. However, there is no evidence of the euro being used to any great extent for invoicing trade between non-euro countries, in contrast with the dollar. Similarly, the euro is being used as an anchor currency mainly by neighboring countries and former African colonies (the CFA franc zone). In short, while the euro has reached a regional status, it has yet to achieve a fully international one.

3. The theory of currency internationalization

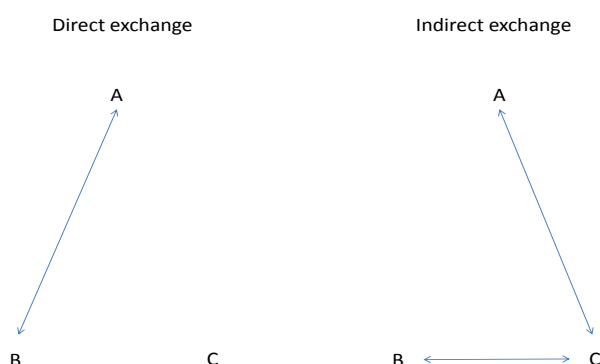
According to Helleiner and Kirshner (2009), the literature on currency internationalization can be classified into three strands. The *market-based* approach highlights three major determinants of currency internationalization: confidence, liquidity, and transaction networks. Within this strand of the literature, currency internationalization is mainly the product of decentralized decisions by the private sector. By contrast, the *instrumental* approach stresses the role of public decisions in the internationalization process. For instance, the emergence of a currency is understood to depend on two factors: first, the willingness of central banks to use said currency as an exchange-rate anchor and their foreign-exchange reserves allocation decisions; and second the willingness of the home country to open up its financial system to non-residents and to allow free capital mobility both inwards and outwards. Finally, the *geopolitical* approach relates currency internationalization to the international order in general. Reflecting on the future of the euro as an international currency requires for these three approaches to be combined. Here we will focus mainly on the market-based strand, as it itself covers several approaches to currency internationalization.

3.1 Transaction costs

The role of transaction costs in the currency internationalization process was first stressed by Swoboda (1969). Krugman (1980) sees the emergence of an international vehicle currency as

related to the combination of transaction costs and of the structure of international payments. Consider three economies (A, B, C). A and B will exchange directly their currencies if such direct exchange is less costly than using the currency of country C as a vehicle, that is exchanging A for C and then C for B (Figure 2). However multiple equilibria may appear since transaction costs are endogenous to the volume of transactions: if A and B start using the currency of C as a vehicle, liquidity on direct transactions between A and B will dry up, raising the cost of such transactions and convincing new agents to use the vehicle C. Krugman concludes that the structure of the foreign-exchange market may durably depart from that of international payments. A change in the structure of the foreign-exchange market would only be triggered by a large discrepancy (incumbency effect), yet were such a change to happen, it may do so rather abruptly. This approach explains both the hysteresis of the international status of a currency and the possibility of occasional abrupt changes.⁵

Figure 2. Direct and indirect foreign exchange



This line of reasoning focuses on the means-of-exchange function of the international currency. However, Portes and Rey (1998) argue that there is a synergy between this function and the store-of-value one: the development of a deep and liquid financial market will lower transaction costs (measured by bid-ask spreads), and enhance the attractiveness of the international currency as a means of exchange. This synergy is magnified by the relative importance of inter-dealer foreign-exchange transactions compared with customer-dealer transactions as a result of chain hedging reactions.

Devereux and Shi (2013) also focus on the interaction between the means-of-exchange and the store-of-value functions, but from another perspective. Using a general equilibrium model with currency “trading posts”, they consider the possibility that inflation in country A (home to the vehicle currency) will shift transaction gains away from the rest of the world and towards the residents of country A. At some point, the rest of the world may select another vehicle currency with lower inflation. Reducing the number of currencies (e.g. through monetary unions) may also lower the incentive for countries to use the international vehicle because of lesser savings on transaction costs.

⁵ Rey (2001) develops a general equilibrium model in the spirit of Krugman (1980) where transaction costs are endogenously determined by the volume of trade, giving rise to “thick market externalities”. Hartmann (1998) rather relates transaction costs to the micro-structure of the foreign-exchange market, where volume and volatility both affect the bid-ask spread.

3.2 Search models

Another strand of the literature focuses on network externalities. Matsuyama et al. (1992) consider a random matching model with two countries. Within each period, a resident of the home country has a probability n to meet another resident of the home country and $\beta(1-n)$ to meet a resident of the foreign country, where $n \in [0,1]$ is the size of the home population, and $\beta \in [0,1]$ is the degree of economic integration between the two countries. The home agent has a probability $(1-\beta)(1-n)$ of meeting no one. There are at least three types of indivisible commodities in this economy and as many types of specialized agents. Each agent of type i is able to produce one unit of commodity $i+1$ after consuming one unit of his own commodity i . Then, commodity $i+1$ must immediately be sold to an agent of type $i+1$ in exchange of one unit of either the home or the foreign currency, which will then be used to buy a unit of commodity i .⁶ At any time, agent of type i can possess one unit of his own production i (the only commodity he can store), the home currency or the foreign currency. The agent of type i derives utility from the consumption of commodity i . To maximize his expected discounted utility, he must meet the right person at the right time. The currency of the larger country then emerges as the international currency; however, unless the degree of integration β is very high, the other currency continues to circulate between the two countries.⁷

As in the model with transaction costs, the central bank can be made to issue the vehicle currency and thus impose an inflation tax. Li and Matsui (2008) explore this possibility by considering the probability that money be confiscated to fund public goods. As in the transaction cost model, the government will find itself forced to implement inflation discipline for fear of its currency losing its international status.

The search model has also been extended to account for the political influence of the country issuing the international currency. For instance, in Pittaluga and Seghezza (2012), the probability that an individual will accept the foreign currency varies depending on the influence capacity of the foreign country. They find that political influence may become the driver of currency internationalisation, acting as a substitute for economic integration.

3.3 Market structure and invoicing

The literature on currency invoicing stresses the importance of market structure and macroeconomic volatility. According to Bachetta and van Wincoop (2005), an exporter will set its price in his foreign customer's currency whenever the price elasticity of foreign demand is high and marginal costs are increasing with output. Failure to do so will induce high volatility of output, with higher marginal costs on average. Under these circumstances, the exporter will also have an incentive to set its price in the same currency as its competitors (strategic externality). In turn, Gopinath et al. (2010) find that firms that adjust their price less frequently will more likely set it in their home currency. An international currency will therefore be more widely used in sectors with frequent price adjustments.

⁶ Agent $i+1$ consumes commodity $i+1$ and then produces one unit of commodity $i+2$. The fact that there are at least three commodities eliminates the possibility of "double coincidence of wants": with three types of agents, commodity $i+3$ is the same as commodity i but it cannot be produced by agent $i+1$, so there is no barter between agents of types i and $i+1$.

⁷ The model goes beyond currency internationalization and covers the case of currency substitution, whereby the international currency is also used for domestic transactions.

In terms of shocks, Devereux et al. (2004) show that an exporter should set its price in the currency of a country subjected to a limited number of monetary shocks. Goldberg and Tille (2008) suggest that trade invoicing could be explained by hedging strategies, while Goldberg and Tille (2013) argue that it can reflect the outcome of a bargaining game between exporters and importers.

Empirically, Friberg and Wilander (2008) report that Swedish exporters reduce the risk of price deviations across markets by using a limited number of invoice currencies; in particular, they select the currencies of larger markets. Customer negotiation largely determines which currency will be used for each trade, with neither competitors' currency choices, nor expected exchange-rate developments being seen as central issues. The authors also find that differentiated goods are more likely to be invoiced in the home currency (the Swedish Krona). These findings are broadly in line with the theoretical literature, except for the downplaying of externalities across competitors and availability of hedging financial instruments.

3.4 Portfolio choices

The market-based approach to currency internationalization covers the store-of-value function for the private sector. Following the standard portfolio-choice model, the allocation of savings across different types of assets relies on a risk-return trade-off; this leads to currency diversification rather than currency polarization (see e.g. Ben Bassat, 1980; Papaioannou et al. 2006). However, as already mentioned, the country issuing the key currency differs from other countries in its ability to provide liquid assets. In such a case, the assets denominated in the international currency are held not only for their risk-return profile, but also as an insurance policy against liquidity shocks: unlike local assets, international currency assets can be sold at any time and for a relatively predictable price. This generates a large demand for these assets, especially from emerging economies (see e.g. Caballero et al., 2008). Hence, liquidity is as important a characteristic as are stability and confidence in supporting the international status of a currency for the store-of-value function.

3.4 Instrumental approach

The instrumental approach to currency internationalization focuses on the role played by government decisions. For instance, the creation of a central bank in the United States and the implementation of major financial reforms at the beginning of the 20th century are considered instrumental to the dollar emerging as the key global currency after World War I (Broz, 1997). The instrumental approach also explains the longevity of the dollar. The US currency kept its key status in spite of the collapse of the Bretton-Woods system: this collapse came in the wake of Japan's export-oriented development strategy (and later on that of China and other East Asian countries), which relied on currency undervaluation through continuous reserve accumulation in US dollars (Dooley et al. 2003). Furthermore, the US dollar has been used as a monetary anchor during disinflation periods (McKinnon, 2003) and as a substitute for regional monetary cooperation (Bénassy-Quéré, 1999).

Goldberg et al. (2014) have shown how important financial stability is for a currency's internationalization. The value of the international currency should remain stable in times of global stress. For a currency to exhibit such a trait, a sound institutional and regulatory framework is required, which requires a low probability of seeing a twin sovereign and financial crisis occur. In Maggiori (2013), an international currency will emerge from a

country (1) whose financial market is well developed and is able to provide for risk sharing, and (2) whose currency appreciates in case of a global crisis and provides non-residents with profitable hedging opportunities.

3.5 Geopolitical approach

The geopolitical approach concentrates on the store-of-value function of the international currency (i.e. the willingness of foreign residents, especially foreign central banks, to hold the currency). It argues that currency internationalization is part of an international political order. This approach was pioneered by Strange (1971) who opposed “negotiated” and “top” currencies. According to her taxonomy, a “top” currency is a currency that grows internationally due to its inherent market appeal (transaction networks, stability, liquidity). In turn, the international status of a “negotiated” currency relies on either an implicit understanding or else the explicit political deal to preserve or promote the currency’s status, with the possibility of sanctions. Kirshner (1995) goes one step further with the concept of “entrapment”: the members of a monetary bloc progressively acquire an interest in maintaining the stability of the incumbent order. For instance, exchange-rate stability within the currency bloc tends to divert trade in favor of the bloc’s members and to encourage them to hold assets invoiced in the bloc’s key currency. They are then “trapped” in the sense that moving away from the currency bloc would involve significant costs.

4. Lessons from History

The conventional historical narrative (Triffin, 1960) states that it was only 30 to 70 years after the United States had overtaken Britain as the leading economic and commercial power that the dollar overtook the sterling as the leading currency of the international monetary system. According to this traditional view, the sterling remained the dominant international currency throughout the interwar years, and even for a brief period after World War II. Recent works have challenged this view and contend that the dollar was adopted over a much shorter period of time. Eichengreen and Flandreau (2009, 2012), and Chițu et al. (2014) show that, in fact, the US dollar had already overtaken the sterling by the mid to late 1920s, be it for official reserve accumulation, international trade, or government bond denomination. They suggest that both inertia and the advantages afforded by incumbency are less potent than previously believed, and find that there may be room for more than one international currency within the global system.⁸ Eichengreen et al. (2014a) also argue that several currencies were used simultaneously for the invoicing and payment functions on the oil market, both before and after WWII. In fact, Eichengreen et al. (2014b) find that, in the post-Bretton Woods period, the currency allocation of official reserves owes more to inertia, with pure network effects (as proxied by the size of the currency-issuing country) having become less important.

Eichengreen (1998, 2011) highlights how crucial are financial regulations and liquidity for an international currency to develop. Before World War I, US banks were prohibited from

⁸ Eichengreen (1998) also points out that the sterling’s position before WWI was not as strong as generally believed: by 1913, the French franc and the Deutsche mark taken together accounted for the same share of foreign exchange holdings as did the sterling, whose own share was in fact inflated by large holdings in India and Japan. In Europe, the sterling only ranked third in reserve holdings, after the franc and the mark. According to Schenk (2010), the sterling’s decline after WWII was cushioned by the collective interest: a number of countries opted to retain a substantial share of their sterling reserve holdings to prevent abrupt changes in the Cold War climate.

opening overseas branches, to the benefit of British banks trading in finance. US banks were even prohibited from discounting trade acceptances or from accepting bills of exchange. Additionally, Eichengreen argues that, starting from the 1860s, the Bank of England fully played its role of lender of last resort, guaranteeing liquidity of the London market, on the top of already guaranteeing full sterling-gold convertibility. In fact, the starting point of the dollar's internationalization was the creation of the Federal Reserve board in 1913 and, with it, the ability to discount or buy (through open market operations) bills and trade acceptances.

Finally, lessons can also be drawn from Japan's failure to internationalize its currency. Eichengreen and Kawai (2014) argue that Japanese policy was not supportive of the yen's internationalization until the late 1980s. In particular, Japanese authorities restricted capital inflows and outflows which they thought would undermine the effectiveness of their monetary and industrial policies. In the 1990s, international capital flows were liberalized and Tokyo became an international financial center, only for the financial and banking crises and the subsequent "lost decades" (1990s and 2000s) to bring the internationalization of the yen to a halt. Japanese trade was carried out mainly with the United States or with East Asian neighbors that had pegged their currencies to the dollar and had made it their trade currency. Finally, regulatory and tax limitations have hindered the development of Tokyo's market for short-term liquid assets.

Eichengreen et al. (2014b) conclude from these examples that it is easier to discourage -rather than to encourage- the use of a currency for official reserve accumulation, and that macroeconomic stability and capital account openness are key aspects of currency internationalization.

5. Prospects for euro internationalization

From the above theoretical and historical analysis, we can conclude that the main conditions for a currency to grow internationally are the following: (i) a large country or monetary area; (ii) deep and liquid financial markets; (iii) nominal stability both internally (low inflation) and externally (a stable or at least "not depreciating" exchange rate); (iv) financial stability and a safe regulatory environment; (v) some attributes of non-economic power (military force, single voice in international forums). The advantages enjoyed by the incumbent currency should not be overblown, and there is room for more than one international currency.

The euro area fulfills the first criterion. As of 2014, the euro area totalized a larger population and a larger trading power than the United States, although it displayed smaller GDP figures (Table 3). Looking ahead, however, the share of the euro area in global GDP is likely to decline. According to Bénassy-Quéré et al. (2013), the share of the EU28 in global GDP could fall from 23% in 2010 to 17% in 2025, at current relative prices. The share of the United States would also fall from 25 to 17%. Conversely, the share of China would rise from 10 to 22% over the same period. According to the size criterion, it is China's renminbi, and not the euro, that should be expected to rival the dollar in the future.

Table 3. The comparative size of the euro area as of end 2014

	Euro area ^{19(a)}	EU28	United States	Japan	China
Population (million)	337.0	506.9	318.9	127.3	1,368.6
GDP (EUR bn) ^(b)	10,110.9	13,920.5	16,035.7	3,759.5	6,973.6
Exports of goods and services (EUR bn excluding intra-EU or intra-EZ) ^{(b),(c)}	2,380.4	2,233.1	1,717.4	625.4	1,779.5

^(a) Including Lithuania which joined on Jan. 1st, 2015. ^(b) at current exchange rates. ^(c) data for 2013. Share of intra-EU/EZ estimated based on Cepii-Chelem bilateral trade data for goods (year 2012).

Sources: World Bank, European Commission, Cepii-Chelem.

The second criterion – deep and liquid financial markets – appears less favorable to the euro for two reasons. First, the financing model of the euro area relies much more heavily on banks than does that of the United States; by construction, this limits the size of the financial market. Second, the monetary union has no fiscal backing: in contrast to the United States, the euro area’s “federal” debt continues to be very low.⁹ On the top of these two weaknesses, the euro area’s financial markets remain fragmented due to different regulations and tax treatments across Member States. Eichengreen (1998) also argues that the conduct of monetary policy in the euro area, which relies on regular refinancing operations with fixed or minimum refinancing rates, is less supportive of currency internationalization than day-to-day liquidity management aiming at stabilizing the short-term interbank interest rate.

The crisis in the euro area undoubtedly dampened the attractiveness of the euro as an international currency, at least in the short term. However, it may also have paradoxically raised the prospects for euro internationalization, thanks to the complete reshuffling of banking supervision (now to be coordinated at the ECB level), the development of the corporate bond market (viewed as an alternative to declining bank loans), and the project of a European “capital market union”.¹⁰ Additionally, the ECB largely played its role of lender of last resort during the global financial crisis, and closely monitored short term liquidity. On the fiscal side, a discussion was launched in 2012 regarding the pros and cons of adding a “fiscal capacity” to complete the monetary union.¹¹ While the euro area started at a disadvantage given the size and liquidity of its financial markets, the situation appears to be changing and it cannot be compared to the low level of development and of openness of China’s financial market, however fast-evolving they may be. Uncertainty however remains over the existence of a major financial center for the euro area, especially in the event of a UK exit.¹²

The third criterion for euro internationalization (nominal stability) is supportive of the euro. This is due to the central bank being independent and having a clear mandate of price stability, to the monetization of government deficits being prohibited by the Treaties and to national government deficits being limited by fiscal rules, thus by reducing the risk of a “fiscal dominance” over monetary policy. As for the exchange rate, it has proved unstable like that of every floating currency, but no weakening trend is to be observed over the 1999-2014 period.

⁹ Claeys et al. (2014) evaluate at EUR 490 bn the total amount of EU-wide public debt denominated in euro at end 2013, covering EFSF/ESM bonds (EUR 230 bn), European Union (EUR 60 bn) and European Investment Bank (EUR 200 bn), and taking into account that the three data sources may not be readily comparable. In any case, the EUR 490 bn hardly compares with the USD 12 600 bn of US federal government debt in 2014.

¹⁰ See Véron (2014).

¹¹ See Van Rompuy (2012).

¹² See Springford et al. (2014).

The fourth criterion (financial stability and a strong legal environment) is becoming more in favor of the euro, notably in view of the progress made toward the establishment of a banking union since the onset of the euro area debt crisis. In contrast, there have been mounting concerns over China and the alleged risks raised by overinvestment, stretched real estate valuations and the shadow banking system. Eichengreen (2013) mentions the lack of a strong, independent legal system as a major impediment to the development of the renminbi as an international currency.¹³ In turn, Kirshner (2014) argues that the US-originated global financial crisis of 2008 may have induced a ‘delegitimization of the American model’, especially in Asia.

The final criterion for the emergence of the euro (geopolitical influence) is clearly missing. Europeans have not yet transferred over their national sovereignty over foreign affairs and military forces, and the European External Action Service introduced by the Lisbon treaty has not proved to be game-changing. This is in sharp contrast with the United States (Posen, 2008). Furthermore, no single Eurozone voice is to be heard, be it at the IMF (where euro members are spread over several constituencies) or at G20 meetings (the larger Member States have their own seat at the G20 table while the smaller ones may not feel adequately represented by the EU seat). However, Kirshner (2014) notes that the United States is no longer the first exporting market for its key military allies in Asia, which may reduce these countries’ stake in promoting the dollar’s continued supremacy.

The dollar’s status as incumbent currency has limited the internationalization of the euro. History tells us that several international currencies can coexist over a long period of time, yet the declining weight of the euro area in the world economy, combined with the hysteresis of the international monetary system, is not supportive of the internationalization of the euro. In this respect, the failure of the yen to emerge as an international currency in the 1990s should act as a useful reminder. To take a more positive spin, one could argue that the drop in transaction costs (due to the development of international financial markets and the expansion of the foreign-exchange market) has lowered the weight of the incumbent’s advantage (see Eichengreen, 2010).

The next question is that of the transition from a unipolar to a multipolar system. Both theory and history suggest a “tipping point” effect: while the emergence of the euro (or of the renminbi) may be delayed, when it does happens it could do so quite rapidly. When estimating the currency distribution of foreign-exchange reserves as a function of size, nominal stability and financial depth (as proxied by foreign-exchange turnover), Chinn and Frankel (2008) find support for a non-linear form with strong inertia. Under their most conservative scenario, the share of the euro in foreign-exchange reserves would grow to 40% by 2020. However, they found mixed results depending on the size, nominal stability and financial depth assumptions; this illustrates the difficulty of making predictions when it comes to currency internationalization.¹⁴

¹³ At the other extreme, the extensive acceptance of extra-territoriality expressed by the US legal system in 2014, both in the Argentina and BNP-Paribas cases, may precipitate the rise of alternative currencies and jurisdictions for future debt issuance and financial transactions.

¹⁴ Incorporating the renminbi in the analysis, Liu and Li (2008) project a 22 to 24% share by 2020 for the euro (15 to 21% for the renminbi).

6. The pros and cons of an international euro

6.1 The euro area viewpoint

Issuing an international currency brings both benefits and costs to the issuing country.

Benefits

The benefits to issuing an international currency are discussed by Papaioannou, and Portes (2008). The first benefit is seigniorage, i.e. the benefits from interest-free loans that non-residents extend to the domestic central bank when they hold banknotes or non-remunerated deposits in the international currency. It is estimated that 60% of Federal Reserve notes are in circulation outside the United States (approximately 4.1% of GDP at end 2013).¹⁵ The volume of seigniorage then depends on the interest rate. With a 1% interest rate, the gain for the Federal Reserve is 0.04% of GDP. For a 4% interest rate, it rises to 0.16% of GDP. According to the ECB (2014), the outstanding amount of euro banknotes outside the euro area was EUR 144.5 bn at end 2013, approximately 1.5% of GDP. While the euro area has the potential to further benefit from seigniorage, especially in an environment of significant interest rates, the figures will nevertheless remain low.

The second benefit to issuing an international currency are the liquidity discount and efficiency gains related to the intensive use of the domestic financial market. According to Warnock and Warnock (2009), the liquidity premium in the United States could represent as much as 80 basis points, producing an annual saving for US borrowers (especially the Treasury) of around 1.2 percent of GDP; this makes the liquidity discount much more profitable than seigniorage.

The third benefit is the ability to escape the “original sin” problem, i.e. to issue international debt denominated in the home currency (the “exorbitant privilege” mentioned by French Finance Minister Valéry Giscard d’Estaing in the 1960s). Issuing debt in the home currency eases a country’s external constraint, as it can go to the printing press to reimburse its creditors. This however is a two-sided advantage given that it could also lead to a higher risk of inflation and hence higher interest rates. In principle, as highlighted by theoretical models, the country issuing the international currency will refrain from resorting to inflation since it would ruin the attractiveness of its currency; this theory has yet to be confirmed empirically.

The fourth benefit of issuing an international currency is reduced uncertainty and transaction costs for domestic firms who can carry out trade in their own currency. This benefit accrues mostly to the tradable sector. The domestic banking sector also benefits from higher activity (compensation, short-term funding), a benefit referred to as “denomination rents” (Swoboda, 1968).

The fifth benefit is partial insulation from foreign shocks. Because most foreign suppliers of the US economy denominate their exports in US dollar, price shocks are not passed onto their US customers. Exchange-rate fluctuations also do not affect US consumer prices to the same extent that they do in other countries, with foreign suppliers absorbing most of the shocks through mark-up adjustments (see Goldberg, 2011).

¹⁵ According to Federal Reserve data.

The final benefit of being the issuer of the international currency is international influence (Cohen, 2012). For instance, the Federal Reserve may extend swap lines in case of a liquidity crisis, yet it will do so at its own discretion. More generally, currency areas and spheres of political influence often run along the same borders. The issuing country can also reap elements of soft power and prestige.

Costs

The main cost traditionally put forward by the literature for issuing an international currency is the loss of control over monetary policy. Firstly, banks outside the issuing country may extend loans in the international currency, triggering possible instability in money creation. Secondly, these banks may also run out of liquidity in the international currency, pushing the issuing central bank to play the role of an international lender of last resort, at the risk of contradicting the domestic objectives of its monetary policy. Finally, because the monetary policy of the issuing country is a global, systemic issue, the issuing central bank may find itself forced to take into account the situation abroad when designing its monetary policy, again at the risk of contradicting its domestic mandate.

A second cost sometimes mentioned is the risk of running an overvalued currency. While the international status of a currency should not be confused with its strength (Bénassy-Quéré and Coeuré, 2010), being the main source of international liquidity may trigger a large demand for domestic riskless assets, putting downward pressure on interest rates (see *supra*) and upward pressure on the exchange rate.

The third cost of issuing the international currency has to do with risk. Gourinchas et al. (2010) argue that the ‘exorbitant privilege’ of the United States materializes in the excess return on assets relative to that on liabilities; this is due to the structure of the US balance sheet, akin to that of a ‘world banker’ with its risky assets and riskless liabilities. Admittedly, this peculiar structure can only be partially attributed to the international role of the US dollar. Yet because one key task of the issuer of the international currency is to provide the rest of the world with safe, liquid assets, the two are strongly correlated. The downside to this ‘exorbitant privilege’ is an ‘exorbitant duty’. It materialized during the 2008 financial crisis with the collapse of the US’s net foreign-asset position, which came as a consequence of the collapse in stock prices and the appreciation of the dollar resulting from the safe-haven effect. Gourinchas et al. hypothesize that only a country with relatively low risk aversion and a high recovery rate on domestic bonds can play this role of a global banker and accrue the associated privileges and duties. This argument raises the question of whether the euro area would be ready for the job.

6.2 The international stability viewpoint¹⁶

Stabilizing hegemony?

Scholars of international relations often point out that a unipolar system exhibits ‘hegemonic stability’ properties (see Kindleberger, 1981, or the critical assessment by Eichengreen, 1989). This idea is rooted in the inter-war experience, a period when “the international economic system was rendered unstable by British inability and United States unwillingness to assume responsibility for stabilizing it” (Kindleberger, 1973, p. 292). The rationale for hegemonic

¹⁶ This section draws on Bénassy-Quéré and Pisani-Ferry (2011).

stability is that the hegemon is supposed to internalize the externalities involved in the provision of a given global public good – here, monetary stability in a broad sense; it can include the provision of liquidity in times of stress, when none of the issuers of competing currencies will have an incentive to behave in this way. For example, the hegemon should refrain from conducting a monetary policy that could destabilize the rest of the world. This discipline results from its global responsibilities and corresponding privileges.

A “leaderless” currency system could theoretically produce the global public good, provided there is effective coordination between the different players. Such coordination was missing during the interwar period (Eichengreen, 1989), and is unlikely to be effective with more than two players; this is all the more so since one player (the euro area) has yet to resolve the issue of its external representation (Cohen, 2009).

According to Cohen (2009), the major risk of monetary power fragmentation is that of “formal leadership aspirations”, i.e. a state-driven rather than market-based leadership struggle. The risk is both economic (e.g. increasingly antagonistic relationships between currency blocs, possibly leading to de-globalization) and geopolitical (e.g. breaking fragile equilibria, such as the one that exists in the Middle East: oil and dollar-support are provided in exchange for military protection).

Although attractive, the “hegemonic stability” theory makes no mention of the possibility that the hegemon will exploit its monetary power rather than internalize global stability in its decision-making process (Walter, 1991). It is unable to account for the actual behavior of past hegemonies such as the UK under the gold standard or the US in the post-war period. The US did act as a crisis coordination-leader during the 1997 Asian crisis, and that the Federal Reserve supplied partner central banks with US dollars through swap agreements during the 2008 global crisis. However, the loose monetary policy of the Greenspan era may not have fully internalized the worldwide impact of cheap credit; by the same token, the US Federal Reserve’s decision to embark on quantitative easing in the aftermath of the crisis, while not deliberately non-cooperative, failed to internalize the impact of the US stance on emerging countries (hot-money inflows).

Under the hegemonic stability approach, the hegemon enjoys undisputed economic predominance and therefore has an unambiguous incentive to preserve and nurture international stability. A straightforward survey of the traditional functions associated with the monetary hegemon immediately suggests however that a country’s declining relative size may affect its ability to play that role. When a country’s claim to monetary hegemony is no longer backed up by its size, the current unipolar monetary system can no longer be expected to remain stable. By contrast, and as already argued by Kwan (2001) and Eichengreen (2010), a multiple currency system would reduce the scope for large imbalances in the issuer country(ies). Such an argument reminds us of the Triffin dilemma (Triffin, 1960): the internationalization of a currency relies on the overly-dynamic supply of assets in this currency, an unstable situation that could lead up to a crisis. Such was the case in 1971 when the relative scarcity of gold (compared with the dollar liquidity that had been accumulated worldwide) forced the United States to suspend its currency’s convertibility into gold. Farhi et al. (2011) argue that the continued dollar supremacy over the international monetary system could give rise to a “new” Triffin dilemma: the rising demand for “safe” US assets, relative to the size of the US economy, is not sustainable, so that the mismatch between dollar supply and gold reserves would be replaced by a mismatch between dollar supply and US fiscal capacity.

The arguments traditionally put forward in favor of the hegemonic system are therefore weaker than may appear at first sight. In post-war Bretton Woods, they may well have provided an initially fair rationale of the monetary order. However, these arguments have since failed to offer any guidance to navigate today's radically different world.

Unstable foreign portfolio choices?

Another argument in favor of a unipolar system, of an entirely different nature, stems from the substitutability of currencies. As long as the international currency is unrivalled in terms of liquidity and risk profile, shocks to expected returns have limited impact on portfolio choices – exchange-rates are relatively stable. But if one (or two) other international currencies were to share the dominant currency's liquidity and risk characteristics, all these currencies would become more substitutable. This would make portfolio allocations more sensitive to shocks to expected returns, and hence exchange rates would become more volatile (see for example United Nations, 2009).

Although straightforward, this line of reasoning refers only to short-run volatility, not medium-term misalignments. Suppose for instance that US assets are expected to yield lower returns. International investors will switch to the competing key currencies, triggering a fall in the value of the dollar; this fall will in turn lead to a rise in expected returns, increasing the willingness of international investors to hold dollars. In short, enhanced substitutability may increase short-run volatility, but not necessarily long-run deviations of exchange-rates from fundamental equilibria. Short-run volatility is easily hedged, as opposed to long-run deviations: therefore, it could be that higher volatility in the short-run partially off-set the cost of exchange-rate volatility.

Based on a portfolio-choice model with three countries, Bénassy-Quéré and Forouheshfar (2014) show that exchange rates are less volatile when there are more international currencies, i.e. when portfolios are more diversified. The reason is that an external shock will require only small adjustments in exchange-rate variations, while a more diversified system will be less vulnerable to the distortions created by fixed exchange-rates. Common sense, in line with this conclusion, favors an international monetary system that matches the multipolarity of the global economy.

The transition

A number of scholars have pondered whether the international monetary system could switch from unipolar to multipolar. Wouldn't such change trigger a major currency and/or financial crisis? Bergsten (1997) and Mundell (1998) call for closer monitoring by the IMF and/or the G7, while Eichengreen (2010) argues it is in the interest of central banks holding large amounts of dollar to smooth the transition. Angeloni et al. (2011) suggest the transition be prepared by fixing and improving the current unipolar system; to do so, the international safety net and surveillance system should be reinforced, China should move gradually toward more capital openness and exchange-rate flexibility and the euro area should strengthen its sovereign and financial frameworks. They also suggest that a greater use of the SDR could help smooth the transition toward a multipolar system by offering a vehicle for reserve diversification.

7. Conclusion

From the above analysis, we conclude that the euro already has many of the attributes that could give it a status similar to that of the US dollar: it is the single currency of a large area, where governance is strong and in favor of nominal stability; its financial markets are open to inward and outward capital flows; it has considerably strengthened its financial regulations and banking supervision since the onset of the 2008 global financial crisis; its judicial system is independent from politics.

The euro area does however lack some key features. The most important of which is growth: without growth, the euro will rapidly become a currency of the past. The second element is fiscal backing for the currency, meaning some form of political union. The third one is a large, liquid, resilient, and unified capital market. Finally, the euro area lacks a unified external representation, that would enable it to speak with one voice. These four issues are already key questions for the success of the euro area itself. We conclude that there is no such thing as a euro internationalization strategy: making EMU a success will naturally raise the attractiveness of the euro as an international currency. Conversely, delaying the necessary reforms in the euro area will ruin the chances of seeing the euro grow internationally, since the euro may not have much longer than a decade before the renminbi takes over.

References

- Angeloni, I., Bénassy-Quéré, A., Carton, B., Darvas, Z., Destais, Ch., Pisani-Ferry, J., Sapir, A., and S. Vallée (2011), « Global currencies for tomorrow: a European perspective », CEPII Research report 2011-01/Bruegel Blueprint 13.
- Bacchetta, Ph., and E. van Wincoop (2005), "A theory of currency denomination in international trade", *Journal of International Economics*, 67 (2), 295-319.
- Bank of International Settlements (2013), Triennial Central Bank Survey on Foreign Exchange and derivative market Activity in 2013, December 2013.
- Bénassy-Quéré, A. (1999), "Optimal pegs for East-Asian currencies", *Journal of the Japanese and International Economies*, 13 (1), 44-60.
- Bénassy-Quéré, A., and B. Coeuré (2010), "Le rôle international de l'euro : chronique d'une décennie », *Revue d'Economie Politique*, 120, 355-377.
- Bénassy-Quéré, A., and Y. Forouheshfar (2014), "The impact of yuan internationalisation on the euro-dollar exchange rate", mimeo.
- Bénassy-Quéré, A., Fouré, J. and L. Fontagné (2013), « Modelling the world economy at the 2050 horizon », *Economics of Transition*, 21(4) 2013, 617-654.
- Bénassy-Quéré, A., and J. Pisani-Ferry (2011), "What International Monetary System for a Fast-Changing World Economy?", in Boorman, J.T. and A. Icard (eds.), *Reform of the International Monetary System*, The Palais-Royal Initiative, SAGE, Chap. 21, 255-98.
- Ben Bassat, A. (1980), "The optimal composition of foreign exchange reserves", *Journal of International Economics*, 10, 285-295.

- Bergsten, F.C. (1997), "The dollar and the euro", *Foreign Affairs*, 76 (4), 83-95.
- Broz, L.J. (1997), *The International Origins of the Federal reserve System*, Ithaca: Cornell University Press.
- Caballero, R.J. , Farhi, E., and P.O. Gourinchas (2008), "An Equilibrium Model of "Global Imbalances" and Low Interest Rates", *American Economic Review*, 98 (1), 358–393.
- Chinn, M. and J.A. Frankel (2008), "Why the euro will rival the dollar", *International Finance*, 11, 49-73.
- Chițu , L., Eichengreen, B. and A. Mehl (2014), "When did the dollar overtake sterling as the leading international currency? Evidence from bond markets", *Journal of Development Economics*, forthcoming.
- Claeys, G., Darvas, Z., Merler, S. and G. Wolff (2014), "Addressing weak inflation: the European Central Bank's shopping list", *Bruegel Policy Contribution*, 2014/05, May.
- Cohen, B. (1971), *The Future of Sterling as an International Currency*, London: Macmillan.
- Cohen, B.J. (2009), "Dollar Dominance, Euro Aspirations: Recipe for Discord?", *Journal of Common Market Studies*, 47, 741-766.
- Cohen, B.J. (2012), "The benefits and costs of an international currency: getting the calculus right", *Open Economies Review*, 23, 13-31.
- Devereux, M. Engel, Ch. and P. Storgaard (2004), "Endogenous exchange rate pass-through when nominal prices are set in advance", *Journal of International Economics*, 63 (2), 263-291.
- Devereux, M. and S. Shi (2013), "Vehicle Currency", *International Economic Review*, 54 (1), 97-133.
- Dooley, M., Folkerts-Landau, D., and P. Garber (2003), "An essay on the revived Bretton Woods system", National Bureau of Economic Research working paper No. 9971, Cambridge: NBER.
- Eichengreen, B. (1989), "Hegemonic Stability Theories of the International Monetary System", NBER Working Paper No 2193, March.
- Eichengreen, B. (1998), "The euro as a reserve currency", *Journal of the Japanese and International Economies*, 12, 483-506.
- Eichengreen, B. (2010), "Managing a multiple reserve currency world", mimeo, April 2010.
- Eichengreen, B. (2011), *Exorbitant Privilege, The Rise and Fall of the Dollar and the Future of the International Monetary System*, Oxford University Press.
- Eichengreen, B. (2013), "Number One Country, Number One Currency?", *The World Economy*, 36 (4), 363-374.
- Eichengreen, B., Chițu , L. and A. Mehl (2014a), "Network effects, homogeneous goods and international currency choice: new evidence on oil markets from older era", ECB working paper No. 1651.

- Eichengreen, B., Chițu, L. and A. Mehl (2014b), "Stability or upheaval? The currency composition of international reserves in the long run", ECB working paper No. 1715.
- Eichengreen, B. and M. Flandreau (2009), "The rise and fall of the dollar (or when did the dollar replace sterling as the leading reserve currency?)", *European Review of Economic History*, 13(3), 377-411.
- Eichengreen, B. and M. Flandreau (2012), "The Federal Reserve, the Bank of England and the rise of the dollar as an international currency, 1914-39," *Open Economies Review*, 23, 57-87.
- Eichengreen, B. and M. Kawai (2014), "Issues for renminbi internationalization: and overview", Asian Development Bank Institute working paper No. 454, January.
- European Central Bank (1999), "The international role of the euro", *Monthly Bulletin*, August, 31-24.
- European Central Bank (2014), The international Role of the Euro, July.
- Farhi, E., Gourinchas, P.O., and H. Rey (2011), "Reforming the International Monetary System", CEPR e-book.
- Feldstein, M. (1997), "EMU and international conflict," *Foreign Affairs* 76, 60-73.
- Friberg, R. and F. Wilander (2008), "The currency denomination of exports – a questionnaire study", *Journal of International Economics*, 75, 54-69.
- Gopinath, G., Itskhoki, O. and R. Rigobon (2010), "Currency choice and exchange rate pass-through", *American Economic Review*, 100, 304-336.
- Goldberg, L.S. (2011), "The international role of the dollar: does it matter if this changes?", Federal Reserve Bank of New York Staff Report No. 522, October.
- Goldberg, L.S., and C. Tille (2008), "Vehicle currency use and international trade", *Journal of International Economics*, 76, 177-192.
- Goldberg, L. and C. Tille (2013), "A bargaining theory for trade invoicing and pricing", NBER Working Paper, No. 18985, April 2013.
- Goldberg, L., Krogstrup, S., Lipsky, J. and H. Rey (2014), "Why is financial stability essential for key currencies in the international monetary system?", Vox column, 26 July.
- Gourinchas, P-O., H. Rey, and N. Govillot (2010), "Exorbitant privilege and exorbitant duty", Bank of Japan, IMES discussion paper 2010-E-20.
- Hartmann, Ph. (1988), *Currency Competition and Foreign Exchange Markets: The Dollar, the Yen and the Euro*, Cambridge University Press.
- Helleiner, E., and J. Kirchner (2009), "The future of the dollar: whither the key currency?", in Helleiner, E. and J. Kirchner (eds.), *The Future of the Dollar*, Cornell University Press.
- International Monetary Fund (2013), *Annual Report on Exchange Arrangements and Exchange Restrictions*, December.

Ivashina, V., D. Scharfstein and J. Stein (2012), "Dollar Funding and the Lending Behavior of Global Banks", *NBER Working Paper Series*, No. 18528, November. Kindleberger, Ch. (1973). *The World in Depression*. University of California Press.

Kindleberger, Ch. (1981), "Dominance and Leadership in the International Economy", *International Studies Quarterly*, 25(2), 242-54.

Kirshner, J. (1995), *Currency and Coercion: The Political Economy of International Monetary Power*, Princeton NJ: Princeton University Press.

Kirshner, J. (2014), *American Power after the Financial Crisis*, Cornell University Press, Ithaca and London.

Krugman, P.R. (1980), « Vehicle currencies and the structure of international exchange, » *Journal of Money credit and Banking*, 12 (3), 513-26.

Krugman, P.R. (1984), « The international role of the dollar », in Bilson, J.F.O., and R.C. Marston, eds., *Exchange Rate Theory and Practice*, University of Chicago Press.

Kwan, C.H. (2001), *Yen Bloc: Towards Economic Integration in Asia*, Brookings Institution Press, Washington D.C.

LI, Y., and A. Matsui (2008), "A theory of international currency and seigniorage competition", mimeo, November.

LIU, L., and D.D. LI (2008), "RMB internationalisation: an empirical and policy analysis", *Journal of Financial Research*, 2008-11.

Maggiori, M. (2013), "Financial Intermediation, International Risk Sharing, and Reserve Currencies", mimeo.

Matsuyama, K., Kiyotaki, N. and A. Matsui (1992), "Towards a theory of international currency", *Review of Economic Studies*, 60 (2), 283-307.

McKinnon, R. (2003), "The world dollar standard and globalization, new rules for the game?", Stanford Institute for Economic Policy Research, SCID Working Paper 181.

Mundell, R. (1998), "What the euro means for the dollar and the international monetary system," *Atlantic Economic Journal*, 36 (3), 227-237.

Papaioannou, E. and R. Portes (2008), "Costs and benefits of running an international currency," *European Economy - Economic Papers* 348, Directorate General Economic and Monetary Affairs (DG ECFIN), European Commission.

Papaioannou, E., R. Portes and G. Siourounis (2006), "Optimal currency shares in international reserves: The impact of the euro and the prospects for the dollar", *Journal of Japanese and International Economies*, 20, 508-547.

Pittaluga, G.B., and E. Seghezza (2012), "Euro vs Dollar: and Improbable threat", *Open Economies Review*, 23, 89-108.

- Portes, R., and H. Rey (1998), "The emergence of the euro as an international currency," *Economic Policy*, 307-343.
- Posen, A. (2008). Why the euro will not rival the dollar. *International Finance*, 11 (1), 75-100.
- Rey, H. (2001), "International trade and currency exchange", *Review of Economic Studies*, 68, 443-464.
- Schenk, C.R. (2010), "How have multiple reserve currencies functioned in the past?", Paper presented at the conference of the Reinventing Bretton Woods Committee, Paris, December.
- Springford, J., Tilford, S. and Ph. Whyte (2014), "The economic consequences of leaving the EU", Final Report of the CER Commission on the UK and the EU Single Market, Centre for European Reform, June.
- Strange, S. (1971), *Sterling and British Policy: A Political Study of an International Currency in Decline*, London: Oxford University Press.
- Swoboda, A. (1968), "The euro-dollar market: an interpretation", *Essays in International Finance*, 64, International Finance Section, Princeton.
- Swoboda, A. (1969), "Vehicle currencies and the foreign exchange market: the case of the dollar, in Aliber, R.Z. ed., *The International Market for Foreign Exchange*, Praeger Special Studies in International Economics and Development, Frederick A. Praeger Publishers, New York.
- Triffin, R. (1960), *Gold and the dollar crisis: the future of convertibility*, New Haven: Yale University Press.
- United Nations (2009), Report of the Commission of Experts of the President of the United Nations General Assembly on Reforms of the International Monetary and Financial System, June.
- Van Rompuy, H. (2012), "Towards a genuine economic and monetary union", Report of the Presidents, 5 December.
- Véron, N. (2014), "Defining Europe's Capital Markets Union", Bruegel Policy Brief, 2014/1, November.
- Walter, A. (1991), *World Power and World Money: The role of hegemony and International Monetary Order*, New York: St. Martin's Press.
- Warnock, F. and V. C. Warnock (2009) 'International capital flows and US interest rates', *Journal of International Money and Finance* 28, pp 903-919